Joints

Traumatic bilateral Achilles tendon rupture in a young athlete treated with percutaneous tenorrhaphy

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Abstract

While rupture of the Achilles tendon is one of the most frequent injuries sustained in sports and physical activity, bilateral Achilles tendon rupture is uncommon. We present the case of a 33-year-old man who sustained a bilateral Achilles tendon rupture in the absence of predisposing factors. The lesions were managed by percutaneous tenorrhaphy and casting. Six months after surgery he was able to return to his daily-life activities and to perform light sports activity. The Authors review the current literature on the management of this rare condition in young people, with or without risk factors.

Keywords: Achilles tendon, rupture, sport, bilateral rupture.

Introduction

In recent years the continuous increase in the number of people doing sports and physical activity has led to a rise in the incidence of tendon injuries, including rupture of the Achilles tendon. This is one of the most frequent tendon injuries, accounting for about 20% of all tendon lesions, and for about 0.02% of all traumatic injuries in the Western population.
Simultaneous bilateral Achilles tendon ruptures, on the other hand, account for less than 1% of all tendon lesions (1). In most cases, risk factors are present, such as chronic tendonitis, or prolonged corticosteroid or antibiotic therapies (1, 2). The present is a case report regarding the treatment of a traumatic simultaneous bilateral Achilles tendon rupture in an athlete without specific risk factors.

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Case description

A 33-year-old male patient presented at our emergency Department following a sport accident: he reported a sprain in both ankles with onset of severe pain and functional impairment while participating in professional snowboarding. A painful palpable gap above the insertion of both Achilles tendons and a positive Thompson's test on both sides were present. No significant radiographic alterations were found (**Fig. 1**), whereas US examination showed complete ruptures (~2 cm) of both Achilles tendons (**Fig. 2**). No risk factors or recent treatments with steroids, anabolic substances or antibiotics were reported. The patient had a body mass index of 24.3. He was treated by two casts in plantar flexion and scheduled to undergo surgical repair the next day. After an adeguate information on the surgical options and a written informed consent, in accordance with the principles of the Declaration of Helsinki, percutaneous tenorrhaphies according to Ma and Griffith were performed under local anesthesia and antibiotic prophylaxis (amoxicillin 2 g) each with a polyester suture no. 2 (3). Postoperatively a cast in plantar flexion was applied bilaterally. The patient was discharged a few hours later, with prescription of oral analgesics and daily low-molecular-weight heparin injections. He was also instructed to completely avoid weight bearing for three weeks. After three weeks, the patient returned for removal: no symptomatic gaps were found and

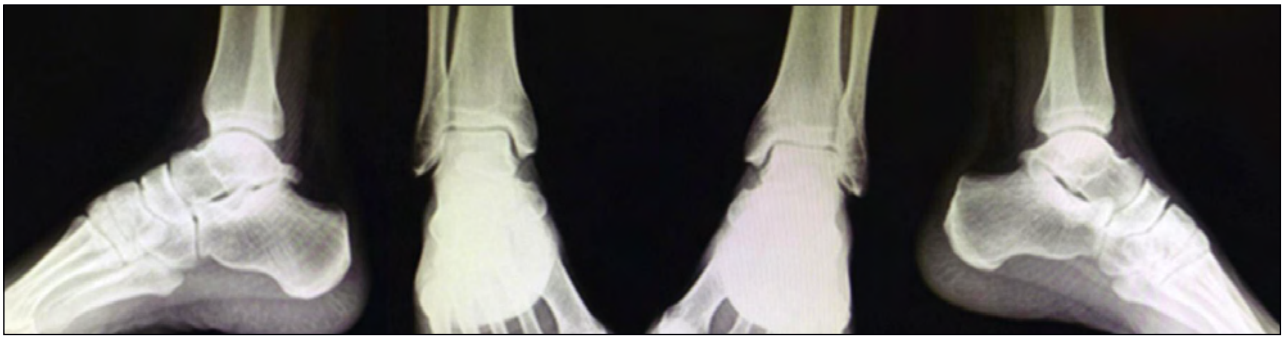

Fig. 1. Emergency room X-rays showing no bone alterations.

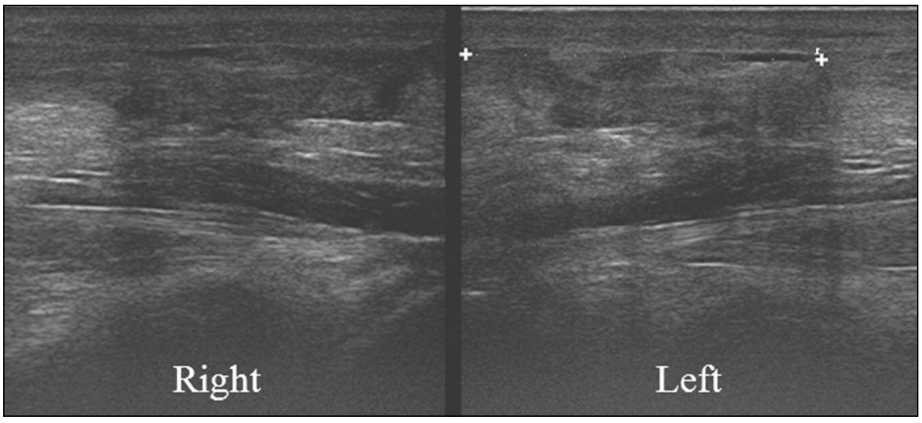

Fig. 2. Bilateral Achilles tendon rupture: appearance on US scans.

walking casts at 90° of flexion were applied, in order to allow a full weight bearing with crutches. After other three weeks, casts were removed and the patient was allowed to perform assisted passive and active exercises to achieve a full range of motion and muscle strengthening. At the six-month follow-up visit he was allowed to perform light exercises (cycling, treadmill), and at eight months to return to his favorite sport activity. At the last follow-up visit (one year after surgery), he was happy, asymptomatic and able to perform his normal daily life and sport activities (**Fig. 3**).

Discussion

Achilles tendon ruptures typically occur in male patients aged between 30 and 50 years, who have a sedentary lifestyle, but who usually participate in demanding sports activities. Bilateral Achilles tendon ruptures are rare and generally occur in elderly patients with chronic diseases (1, 2). In young patients is widely accepted that spontaneous ruptures may be the consequence of a preexisting tendinopathy, and they tend to occur in subjects with intrinsic abnormalities of the foot or a poor level of physical fitness (4). Bilateral tendon injuries are uncommon in young subjects without risk factors. Krolo et al., in a study population of 214 athletes and non-athletes, showed that active athletes <30 years and >30 years of age had, respectively, a 3-fold and 2.5-fold increased risk of sustaining an Achilles tendon injury compared with non-athletes (4).

No single and specific cause of Achilles tendon ruptures has been identified, even though several conditions have been considered risk factors: a zone of hypovascularity in the distal tendon, an area of structural weakness located about 6 cm proximal to the calcaneal insertion, a decreased metabolic rate leading to slow healing, repetitive microtrauma, use of local or systemic steroids or antibiotics (fluoroquinolones), and aspecific tendon degeneration (1, 2). The mechanical properties of Achilles tendons are affected by age, sex, disuse/overuse, endurance, and resistance training. Aging, which brings morphological changes, normally induces a reduction in cell density and a reduction in the diameter of collagen fibril: these changes may contribute to the finding of increased injury rates in older athletes (4). Another theory is that

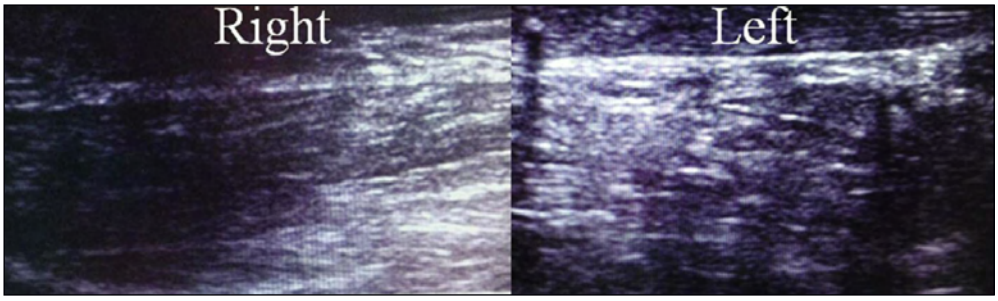

Fig. 3. Postoperative appearance on US scans.

failure of the normal inhibitory mechanism of muscle tendon units may result in an uncoordinated muscle contraction leading to tendon failure (4). However, the prevention and the treatment of Achilles tendon ruptures in athletes are still controversial issues. In recent decades, several open and minimally-invasive surgical approaches have been proposed. Both of these have their advantages and pitfalls, but significant differences in complication rates have been reported. The percutaneous repair proposed by Ma and Griffith showed low rates of complications (4-10%), mostly related to sural nerve lesions, new rupture and superficial infections. However, it is widely accepted that this technique is associated with absence of wound healing complications, faster discharge from hospital, and a better cosmetic appearance with respect to the open repair technique (3). The open surgical treatment may ensure a more anatomical tendon reconstruction and greater strength of the suture, but it has been associated with higher rates of complications (infections, delayed wound healing, thromboembolism), ranging from 11.8 to 21.6% (3). Several studies have ascertained the efficacy of percutaneous repair with comparable results to open repair in terms of strength and timing of return to previous activities (3, 5).

The rehabilitation protocol after cast removal is substantially independent from the type of surgical technique used. Early mobilization may lead to decreased adhesions and limited muscle atrophy (5). In most series several and heterogeneous protocols have been proposed, with only two common features: early rehabilitation but no immediate weight-bearing (3, 5). It is suggested that this approach reduces the risk of a new rupture and of tendon lengthening (5).

As reported in the present case, percutaneous repair of the ruptured Achilles tendon seems to be an useful treatment that may be strongly recommended also in cases of bilateral injuries, given the high probability of good clinical outcomes and low rates of complications.

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